Exploring connections between mathematics and Arts and Culture:

A case study involving two Grade 9 Arts and Culture teachers.

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Declaration

I declare that this research report is my own unaided work. It is being submitted for the degree of Master of Science in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

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Jabulane Dhlamini

_____day of _____ 2009

Epigraph

“Transferability of skills from one context to the next depends on factors such as the number of symbolic components that are shared,…”

Anderson, J., Reder, L., and Simon, H. (1996)

Abstract

This report presents results of an empirical study which investigated how two grade 9 Arts and Culture teachers incorporated mathematics in their Arts and Culture lessons in their classrooms in South Africa. The study was implemented through concept mapping activities undertaken by these Arts and Culture teachers. Data was collected from these concept mapping activities and follow-up interviews with teachers. The analysis of the collected data revealed that teachers grapple with the notion of integration, particularly, when it comes to the transfer knowledge and skills across different learning contexts. Lack of proper training, insufficient teacher knowledge and inadequate support from curriculum designers seem to be the most inhibiting factors for teachers to navigate successfully through the notion of integrated teaching and learning. However, in a bid to deal with these new pedagogical challenges, it was observed that teachers resort to other forms of integration, such as relying on students in order to forge links between subjects of learning. The analysis of data from this study raised important pedagogical issues about the link between integrated teaching and teacher content knowledge, and the apparent need for teachers to transform their identities.

Drawing from the theory of situated learning, this study has argued that, although integration between fields of learning is desirable in teaching and learning, it is highly problematic in actual practice. For instance, through this study, it was observed that Arts and Culture teachers struggle to use their knowledge of Arts and Culture and mathematics in order to forge connections between the two fields of learning. The study has also drawn from Bernstein's theoretical constructs in order to argue that teachers, particularly those in different learning fields like Arts and Culture and mathematics, intuitively posses different 'pedagogical codes' which account for their inability to negotiate meaning across different learning contexts.

Finally, the study has explored and exploited the argument presented through the van Hiele's theoretical framework that students turn to progress quicker in geometry (mathematics) when learning takes place in different styles. I have subsequently used this theoretical framework to argue that connections between Arts and Culture and mathematics should be encouraged at school level, as Arts and Culture could provide an exciting pedagogical environment for the teaching and learning of mathematics, which is often construed to be abstract.

Keywords

Integration

Connections

Links

Mathematics

Arts and Culture

Context

Dedication

To

my wife Lillian

and our three sons

Musa, Andile and Banele

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Acronyms

AC	Arts and Culture
AC-AC	Integration within Arts and Culture as a subject
AC-life	Integration of Arts and Culture with an out-of-school world
AC-MAT	Integration of Arts and Culture with mathematics
AC-real	Integration of Arts and Culture with an out-of-school world
AC-subject	Integration of with any other subject except mathematics
AIDS	Acquired Immune Deficiency Syndrome
AS	Assessment Standard
BA	Bachelor of Arts
BEd	Bachelor of Education
DoE	Department of Education and Training
et. al.	And other authors whose names are not mentioned
GDE	Gauteng Department of Education
GET	Genera Education and Training
HIV	Human Immunodeficiency Virus
Ibid.	Referring to the same previously quoted source
LO	Learning Outcome
MAT	Mathematics
NGO	Non-governmental Organisation
OBE	Outcome Based Education
p.	Page
PTC	Primary Teachers' Course
RNCS	Revised National Curriculum Statement
RO	Research Objective
RQ	Research Question
SAARMSTE	Southern African Association for Research in Mathematics, Science and Technology Education
STD	Secondary Teacher's Diploma
2-D	Two-dimensional
3-D	Three-dimensional

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